

**WHAT IS CLAIMED:**

1. An integrated digital television (DTV) diagnostic instrument comprising:  
at least one of a video display device (VDD) and an audio display device (AudDD);

DTV circuitry (AV) to receive a DTV signal, to reconstruct at least one of a video stream and an audio stream from said DTV signal, and to display at least one of said video stream and said audio stream on said VDD or said AudDD, respectively; and

at least one of

monitoring circuitry (M), responsive to said DTV circuitry, to monitor digital properties of a live DTV signal and

analysis circuitry (AN), responsive to said DTV circuitry, to analyze digital properties of a recorded DTV signal.

2. The instrument of claim 1, wherein said instrument includes both said VDD and said AudDD, and wherein said DTV circuitry is operable to reconstruct and to display both of said video stream on said VDD and said audio stream on said AudDD.

3. The instrument of claim 1, further comprising an antenna to receive a broadcast of said DTV signal, wherein said DTV circuitry is connected to receive said DTV signal from said antenna.

4. The instrument of claim 1, further comprising:  
recording circuitry (R) to record said DTV signal.

5. The instrument of claim 4, wherein said instrument has one of the following sets of features: AV, AN and R;

AV, M and R; and

AV, M, AN and R.

6. The instrument of claim 1, further including quantitative circuitry (VSB) to quantitatively monitor at least one metric of the quality of a live DTV signal.

7. The instrument of claim 6, wherein said VSB is operable to display at least one of a first graph of a carrier to noise ratio of said DTV signal at an input to a vestigial side band (VSB) decoder, a second graph of a packet error count and a plot of equalizer tap coefficients.

8. The instrument of claim 7, further comprising:  
recording circuitry (R) to record said DTV signal;  
wherein said instrument has one of the following sets of features:

VSB, AV, AN and R;

VSB, AV, M and R; and

VSB, AV, M, AN and R.

9. The instrument of claim 6, wherein said instrument has the following set of features: VSB, AV, and M.

10. The instrument of claim 1, wherein said monitoring circuitry and said analysis circuitry are embodied by a processor running software.

11. The instrument of claim 1, wherein said monitoring circuitry is operable upon a live signal from said DTV circuitry to do at least one of the following :  
check for correct syntax of MPEG-2 transport packets;

determine existence, syntax, consistency, and frequency of at least one of MPEG-2 System tables and ATSC PSIP tables;

determine percentage of transport stream used by various data types, channels, and elementary streams;

determine transmission frequency of the Program Clock References (PCRs);  
generate alarms upon occurrences of errors and upon exceeding specified thresholds; and

trigger a recording upon occurrences of errors and upon exceeding specified thresholds.

12. The instrument of claim 1, wherein said analysis circuitry is operable upon a recorded output of said DTV circuitry to do at least one of:

check for correct syntax of MPEG-2 transport packets;

determine existence, syntax, consistency, and frequency of at least one of MPEG-2 System tables and ATSC PSIP tables;

determine percentage of transport stream used by various data types, channels, and elementary streams;

determine transmission frequency of the Program Clock References (PCRs);  
generate alarms upon occurrences of errors and upon exceeding specified thresholds; and

trigger a recording upon occurrences of errors and upon exceeding specified thresholds.

13. The instrument of claim 1, wherein said analysis circuitry is operable upon a recorded output of said DTV circuitry to do at least one of:

drill down into the contents of individual MPEG-2 transport packets; and

present a visualization of the individual MPEG-2 transport packets in the broadcast stream.

14. The instrument of claim 6, wherein metrics include a graphical depiction of one or more vestigial side band (VSB) properties including at least one of packet error counts, carrier-to-noise ratio and equalizer coefficients.

15. The instrument of claim 1, further comprising a controller operable to display pointing-device-clickable buttons on said VDD that are used to invoke functionalities of said monitoring circuitry and said analysis circuitry.

16. The instrument of claim 15, wherein said controller is embodied by a processor running software.

17. The instrument of claim 15, wherein said buttons are arranged on said VDD in order of a coarsest level of information granularity to a finest level of information granularity such that the arrangement takes advantage of a user's tendency to progress from using coarse tools to fine tools when solving a problem.

18. The instrument of claim 1, wherein the instrument is housed in an easily portable chassis.

19. An integrated digital television (DTV) test instrument comprising:  
a video display device (VDD);  
DTV circuitry (AV) to receive a DTV signal, to reconstruct at least one of a video stream and an audio stream from said DTV signal; and  
a controller to perform at least one of  
monitoring functionality, upon an output of said DTV circuitry, that monitors digital properties of a live DTV signal and  
analysis circuitry, upon said output of said DTV circuitry, analyzes digital properties of a recorded DTV signal;

said controller being operable to display pointing-device-clickable buttons on said VDD representing said monitoring functionalities and said analysis functionalities.

20. The instrument of claim 19, wherein said controller is embodied by a processor running software.

21. The instrument of claim 19, wherein said buttons are arranged on said VDD in order of a coarsest level of information granularity to a finest level of information granularity such that the arrangement takes advantage of a user's tendency to progress from using coarse tools to fine tools when solving a problem.

22. For an integrated digital television (DTV) diagnostic instrument having at least one of a video display device (VDD) and an audio display device (AudDD), having DTV circuitry (AV) to receive a DTV signal, to reconstruct at least one of a video stream and an audio stream from said DTV signal, and to display at least one of said video stream and said audio stream on said VDD or said AudDD, respectively, and having a programmable processor,

a processor-readable article of manufacture having embodied thereon software comprising a plurality of code segments including at least one of

a first segment to monitor to digital properties of a live DTV signal from said DTV circuitry, and

a second code segment to analyze digital properties of a recorded DTV signal.

23. The article of manufacture of claim 22, wherein the processor-readable software further includes:

a third code segment to display pointing-device-clickable buttons on said VDD representing the monitoring functionalities and the analysis functionalities.

24. The article of manufacture of claim 23, wherein said third code segment is operable to arrange said buttons on said VDD in order of a coarsest level of information granularity to a finest level of information granularity such that the arrangement takes advantage of a user's tendency to progress from using coarse tools to fine tools when solving a problem.

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